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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Jack FIFE, Brian SMITH and Garvin WEBER
Serial no. : 10/718,841
Filed : November 21, 2003
For : SANITATION SYSTEM FOR REFRIGERATED
FIXTURE HAVING AN AIR CURTAIN
Group Art Unit : 1746
Examiner : Frankie L. STINSON
Docket : THOLAM P217US

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SUBMISSION OF CERTIFIED COPY

Dear Sir:

A claim for priority is hereby made under the provisions of 35 U.S.C. § 119 for the above-identified United States Patent Application based upon Canada Patent Application No. 2,412,244 filed November 21, 2002. A certified copy of said Canada application is enclosed herewith.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,

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Specification and Drawings, as originally filed, with Application for Patent Serial
No: **CA 2412244**, on November 21, 2002, by **JACK FIFE, BRIAN SMITH and
GARVIN WEBER**, for "Sanitation System for Refrigerated Fixture Having an Air
Curtain".

L. Lachance
Agent certificateur / Certifying Officer

June 7, 2007

Date

Canada

(CIPO 68)
31-03-04

OPIC  CIPO

ABSTRACT OF THE DISCLOSURE

A sanitation system for a refrigerated fixture having an air curtain. This sanitation includes a spray manifold positioned in a case tank of the refrigerated fixture. A
5 reservoir is provided which is adapted to contain disinfectant. A pump is provided to pump disinfectant from the reservoir through the spray manifold, whereby disinfectant is sprayed into the case tank. A controller is connected to the pump and adapted to control the frequency
10 and duration of the spray through the spray manifold.

TITLE OF THE INVENTION:

Sanitation System For Refrigerated Fixture Having An Air Curtain

FIELD OF THE INVENTION

The present invention relates to a sanitation system for a refrigerated fixture having an air curtain.

BACKGROUND OF THE INVENTION

A refrigerated fixture has a product support positioned over a recessed area, referred to as a "case tank". An air curtain is used to maintain product positioned on the product support within a required temperature range, often referred to as a "core temperature" or "critical air temperature". The air curtain keeps out ambient air that would raise the product temperature and has little or no discharge of cool air into the room.

The air curtain has a circular circulation of air. Cool air exiting a refrigeration unit is discharged onto a first side of the product support and flows across the product to a second side of the product support. A return air duct is positioned at the second side of the product support and a fan is positioned within the case tank. The fan draws air through the return air duct and directs the air back into the refrigeration unit.

With some types of product, such as fruit and vegetables, water misters operated on timers are used to moisten the product. With other types of product, such as seafood and red meat, the product has natural juices that drip through the product support and into the case tank. As a result, the case tank tends to be a cool, damp and dark environment. Unfortunately many bacteria, such as

Pseudomonas Aeruginosa, thrive in a cool, damp and dark environment. A bacteria concentration of as little as one to six parts per million can cause illness in humans. Should the case tank become contaminated, the air circulation of the air curtain will repeatedly pass contaminated air over the product until the product on display is thoroughly contaminated. The sanitizing of the case tank of a refrigerated fixture is, therefore, of vital importance. Periodic cleaning by store personnel is inadequate to address the dangers of contamination of refrigerated fixtures by salmonella, staphylococcus, black mould, E.Coli, streptococcus, and the like.

SUMMARY OF THE INVENTION

What is required is an effective sanitation system for refrigerated fixtures having an air curtain.

According to the present invention there is provided a sanitation system for a refrigerated fixture having an air curtain. This sanitation includes a spray manifold positioned in a case tank of the refrigerated fixture. A reservoir is provided which is adapted to contain disinfectant. A pump is provided adapted to pump disinfectant from the reservoir through the spray manifold, whereby disinfectant is sprayed into the case tank. A controller is connected to the pump and adapted to control the frequency and duration of the spray through the spray manifold.

The most effective disinfectant tested appears to be a quaternary ammonium. This disinfectant is effective in concentrations of 200 parts per million. Even more beneficial results may, therefore, be obtained when water is supplied to the pump as a diluent via a water supply line and a metering

valve is used to combine desired proportions of water and disinfectant.

5 A calcium build-up can, over time, adversely affect the functioning of the sanitation system. Even more beneficial results may, therefore, be obtained when a filter is provided on the water supply line to filter out contaminants.

10 Any form of backflow in the system would be counterproductive. It is undesirable to have a backflow of disinfectant into the water system. Even more beneficial results may, therefore, be obtained when a one way valve is positioned on the water supply line to prevent backflow. A backflow into the reservoir would stop the proper proportions
15 of disinfectant and water being mixed. Even more beneficial results may, therefore, be obtained when a one way valve is disposed between the reservoir and the pump to prevent backflow.

20 It is envisaged that the reservoir, pump, and controller will all be positioned on a single panel. The panel can then be installed in a convenient location near the refrigerated fixture and feed lines run to the spray manifold within the case tank.

BRIEF DESCRIPTION OF THE DRAWINGS

25 These and other features of the invention will become more apparent from the following description in which reference is made to the appended drawings, the drawings are
30 for the purpose of illustration only and are not intended to in any way limit the scope of the invention to the particular embodiment or embodiments shown, wherein:

FIGURE 1 is an end elevation view of a refrigerated fixture equipped with a sanitation system constructed in

accordance with the teachings of the present invention.

FIGURE 2 is a detailed front elevation view of a panel containing components of the sanitation system illustrated in **FIGURE 1**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment, a sanitation system generally identified by reference numeral 10, will now be described with reference to **FIGURES 1** and **2**.

Structure and Relationship of Parts:

Referring to **FIGURE 1**, sanitation system 10 was developed for use with a refrigerated fixture, generally indicated by reference numeral 100. Refrigerated fixture 100 consists of a body 110, base 112 and outer shell 114. Body 110 has a case tank 116 with fans 118 and a refrigeration unit 120. Refrigerated fixture 100 is further adapted with product support 122 having a first side 124 and a second side 126. Fans 118 create air circulation 128 that passes through refrigeration unit 120 and out cool air discharge vents 130. Air circulation 128 then passes from first side 124 over product 132 to second side 126 and ultimately through return air ducts 134. This air circulation forms an air curtain 136 over product 132. Refrigeration fixture 100 may be further adapted with water accessory 138 and water misters 140.

Sanitation system 10 has panel 12 with feed lines 14 connecting to spray manifolds 16. Spray manifolds 16 are adapted with nozzles 18 which effect spray 20. Referring to **FIGURE 2**, the following components are positioned on panel 12: a reservoir 22 adapted to contain disinfectant, a metering valve 24 and a pump 26 adapted to meter and pump disinfectant. A transformer 28 is provided which is adapted to regulate voltage and a controller 30 is provided which is

adapted to control frequency and duration of disbursement of disinfectant. A water supply line 32 passes through a one way valve 34 and a filter 36 and connects to pump 26. A disinfectant supply line 38 passes through a second one way valve 40 and connects to metering valve 24. Wiring harness 42 connects transformer 28 and controller 30 to pump 26. Feed line 14 connects pump 26 to spray manifold 16 and nozzles 18.

Operation:

The use and operation of a sanitation system 10 will now be described with reference to **FIGURES 1** and **2**. Referring to **FIGURE 2**, water is supplied through water supply line 32 and passes through first one way valve 34. One way valve 34 prevents water from reversing flow and permitting disinfectant to pass into the municipal water system. Water proceeds through filter 36 to reduce calcium build-up within the system. Disinfectant is drawn from reservoir 22 through second one way valve 40. Second one way valve 40 also prevents water disrupting the flow of disinfectant. Power is regulated and controlled by transformer 28. Controller 30 intermittently activates pump 26 according to a programmed schedule relating to frequency and duration of disinfectant. As water and disinfectant are pumped through metering valve 24, metering valve 24 determines the ratio of disinfectant to water and the resultant mix is transported through feed lines 14 to spray manifolds 16. Nozzles 18, when spaced along spray manifold 16 disperse an effective amount of disinfectant within case tank 116 such that virtually all bacteria in case tank 116 is killed.

Cautionary Warnings:

The disinfectant selected must be capable of providing a 100% kill rate. In tests the best disinfectant of those tested was quaternary ammonium. Quaternary ammonium

in concentrations of 200 parts per million had a 100% kill rate. However, quaternary ammonium had some undesirable side effects. It adversely affects some types of plastics. Care should be taken when using plastic components, such as plastic valves. The spray manifold should be arranged to provide thorough spray coverage within the case tank. This was achieved by placing nozzles every 12 inches and using a swirling spray pattern.

In this patent document, the word "comprising" is used in its non-limiting sense to mean that items following the word are included, but items not specifically mentioned are not excluded. A reference to an element by the indefinite article "a" does not exclude the possibility that more than one of the element is present, unless the context clearly requires that there be one and only one of the elements.

It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.

**THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:**

- 5 1. A sanitation system for a refrigerated fixture having an
air curtain, comprising:
a spray manifold positioned in a case tank of a
refrigerated fixture;
a reservoir adapted to contain disinfectant;
10 a pump adapted to pump disinfectant from the reservoir
through the spray manifold, whereby disinfectant is sprayed
into the case tank;
a controller connected to the pump and adapted to
control the frequency and duration of the spray through the
15 spray manifold.
2. The sanitation system as defined in Claim 1, wherein the
disinfectant is a quaternary ammonium.
- 20 3. The sanitation system as defined in Claim 1, wherein water
is supplied to the pump via a water supply line and a
metering valve is used to combine desired proportions of
water and disinfectant.
- 25 4. The sanitation system as defined in Claim 3, wherein a
filter is provided on the water supply line to filter out
contaminants.
5. The sanitation system as defined in Claim 1, wherein a one
30 way valve is positioned on the water supply line to prevent
backflow.
6. The sanitation system as defined in Claim 1, wherein a one
way valve is disposed between the reservoir and the pump to
35 prevent backflow.

7. The sanitation system as defined in Claim 1, wherein the reservoir, pump, and controller are positioned on a panel.

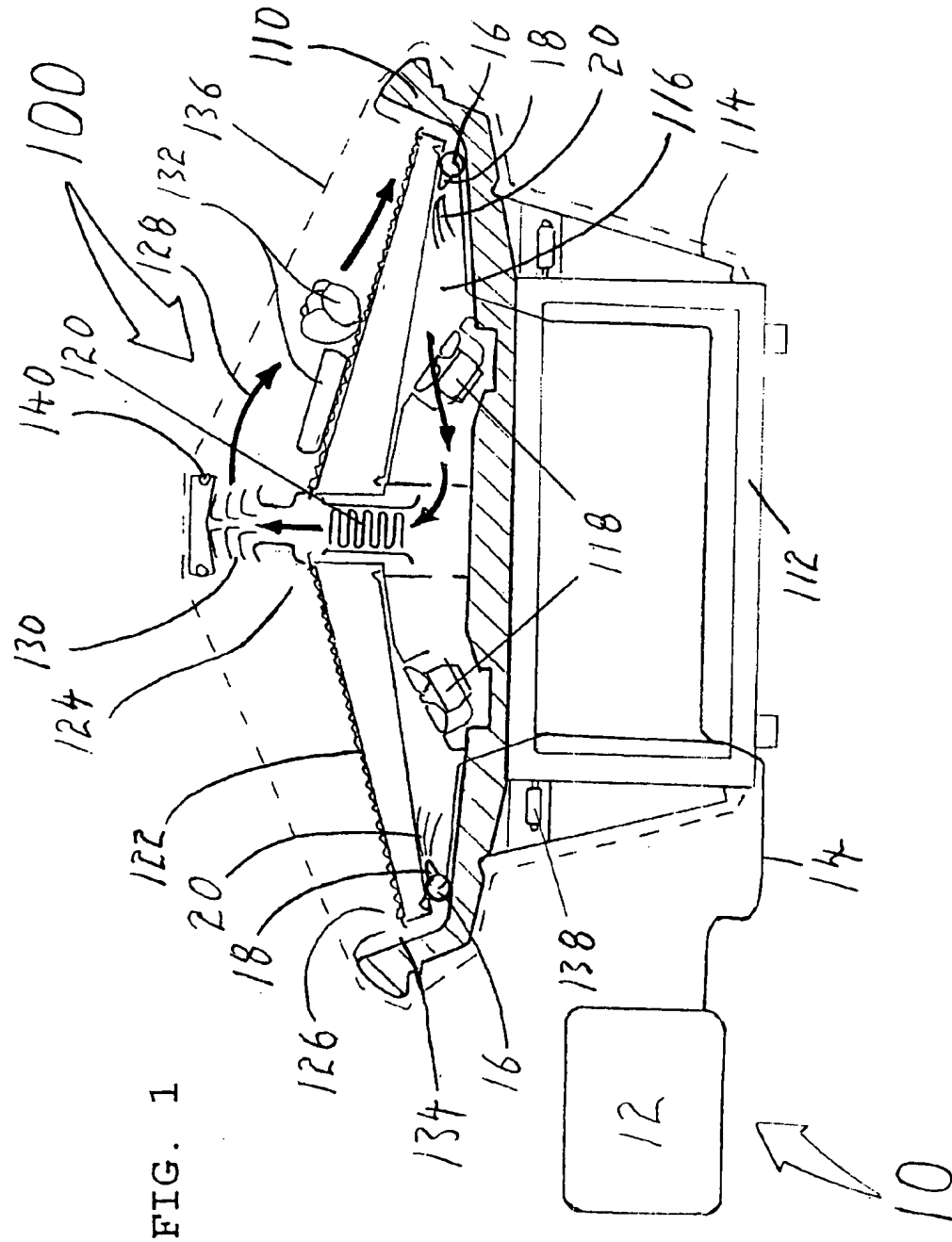


FIG. 2

